POPULATION BULLETIN

POPULATION REFERENCE BUREAU

Volume 2 JANUARY-FEBRUARY 1946 *Numbers 1-2*

Birth Rates and Education

(Pictograph on Pages 6-7)

SUMMARY

In the December *Population Bulletin* we presented an analysis of Census Bureau records which showed that as education goes up birth rates go down.

As a result of that analysis we have been asked a number of questions which might be grouped under three headings:

1. What are the causes of differences in birth rates among education groups?

2. How will the present differences in birth rates affect the composition of our population?

3. Can the differences in birth rates be reversed?

Obviously these are complex questions and the reader's judgment should be reserved until he has had an opportunity to study the evidence for himself.

The balance of evidence which we have analyzed over a period of more than 20 years indicates that the chief cause of the differences in birth rates among education and economic groups is the difference in knowledge as to the means of controlling the birth rate.

As regards question 2, the pictograph on pages 6-7 shows how the present differences in birth rates among education groups will affect the composition of the population of the United States over a period of three generations, if these differences continue.

The differential birth rate definately has been reversed in Stockholm, Sweden. Swedish and American demographers who have analyzed the Stockholm records attribute this reversal to the democratization of knowledge as to the means of controlling the birth rate.

These questions and the evidence pertaining to them will be analyzed in the following pages, but first let us briefly review the picture of the differential birth rate in the United States today and consider its significance to the welfare of the Nation.

I. The Differential Birth Rate

The Census Bureau data analyzed in our December *Bulletin,* and which we shall analyze and discuss further, showed that native

white women in the age group 45-49 in 1940 who had completed only one to four years of grade school had given birth to 4⅓ children per woman. In contrast, native white women in the same age group who had completed four years or more of college had given birth to only 1¼ children per woman.

The census figures showed that all along the line as the educational status of the women increased the birth rate decreased. There was one minor exception. Women who had completed no years of school had a slightly lower birth rate per woman than women who had completed from one to four years of grade school. The former are largely pathological cases and many of them may be confined in institutions. But the census figures showed that when these women mixed with the public, they had more children per *marriage* and per *mother* than the latter. Women who had no years of schooling had 5¼ children per mother, compared with 5 children per mother for women who had completed one to four years of grade school. High school graduates had 2.6 children per mother, and college graduates 2.4.

The 45-49 age group was chosen as a basis because this is the age group of women who have just completed childbearing. If a younger age group is chosen, say women aged 30-34 or 20-24, the differences in birth rates among education groups become more extreme.

When we analyzed birth rates of economic groups, we found similar results. As the economic status of the women increased the birth rate decreased. Native white women aged 45-49, the monthly rental value of whose homes was under $5, had given birth to 4½ children per woman, while on the other hand, native white women in the same age group, the monthly rental value of whose homes was above $40, had given birth to about 1¾ children per woman.

Possible Economic and Social Problems

The Census Bureau records indicate that if one divides the population of the United States into three nearly equal groups, either education or economic, he finds that the lowest education or economic third is increasing more than twice as fast as the highest education or economic third. If this situation were to continue for three generations (a period of about 84 years), the descendants of the lowest education or economic third would become at least nine times as numerous as the descendants of the highest education or economic third.

One of the basic elements of a strong and progressive democracy is an adequate amount and distribution of wealth. Yet, it readily may be seen that when one-third of the population is increasing

twice as fast as another one-third, it is practically an impossible task to establish and preserve an adequate amount and distribution of wealth. When the fastest increasing third happens to be the least equipped economically and educationally, as is the case in the United States, it is reasonable to say that this task is impossible. Perhaps the chief reason why the United States has been able to preserve its democratic institutions to date is that it has had a favorable relationship between number of people and natural resources, but authorities on this subject point out that this favorable relationship is deteriorating.

Of course there is a constant shifting of population from one education or economic group to another, but if we will study the Census Bureau records from the 65-74 year age group down to the 20-24 age group, a period representing fifty years, we shall find that regardless of the shifting of population, the lowest education or economic third has the highest birth rate, and the highest education or economic third has the lowest birth rate. It appears that when individuals shift from one group to another their birth rates take on the characteristics of the new group.

There also is a shifting of population from lower grades to higher grades of education. In other words, there has been a big increase in high school and college students during the past fifty years, but still the lowest education third continues to far outstrip the highest education third in birth rates.

The indications are that to understand and be able to help solve the complex problems of a modern democracy requires at least a high school education if not a college education. But if advancement in education is to be used as one standard, the standards of qualification for advancement from one grade to the next cannot be lowered. If the qualifications for high school and college graduation are lowered, or if our young people are rushed through grades on the mass-production scale with little regard to demonstrated qualifications and intelligence, education as a standard may not mean very much. Various surveys have shown that many high school and college graduates do not possess the knowledge which might reasonably be expected. Whether this is due to a defect in our educational system or to a lack of ability in many individuals, or both, is an open question. A study of intelligence quotients may help to answer part of this question.

Intelligence Tests

Intelligence tests, usually called I.Q. tests, are not perfect measures of natural or inborn intelligence, but they are the best measurement that science has been able to construct and they have demonstrated

their practical value in most all of our progressive schools.

Lorimer and Osborn in their authoritative book, *Dynamics of Population*, pp. 195-199, quote a number of studies showing variations in fertility among individuals classified by intelligence. Here we have space to quote only one study, but all the studies point to the same general results.

A study of clinic and school data concerning children in Bridgeport, New York City, Englewood, St. Louis, and vicinities, shows that children with the lowest intelligence scores (I.Q. under 60) came from families which averaged nearly 6 children. The next lowest group, the feeble-minded (I.Q. 60 to 70), came from the next largest families, which averaged nearly 5½ children. The borderline feeble-minded children (I.Q. 70 to 80) came from families which averaged more than 5 children. The "dull" and "backward" (I.Q. 80 to 90) came from families which averaged more than 4½ children. Those considered "normal" (I.Q. 90 to 110) came from families which averaged less than 4 children. Those reckoned of superior intelligence (I.Q. 110 to 130) came from families that averaged a little over 3 children. Lastly, the children of very superior intelligence suggesting genius (I.Q. 140 and over) came from families which averaged less than 2½ children.

Commenting upon such studies, Lorimer and Osborn conclude ". . . at present the negative association between fertility and cultural-intellectual level in the population of the United States reveals a powerful force that is working against our most cherished national ideals and that threatens to defeat the aims of the whole public education movement."

However, this does not mean that there is not plenty of room for improvement of our national education system. One American education authority has written us saying that the United States and England would do well to study the education system of Sweden, where, as we shall presently show, the differential birth rate has been reversed in Stockholm.

Pictograph

The pictograph on pp. 6-7 represents the increase in population of the lower, middle, and higher education thirds of our population. The women used as a basis are native white aged 45-49 with completed families. No allowance is made for under-reporting of children which is greater among the lower education groups.

The first woman on the left represents 100 women of a total of 751,120 native white women aged 45-49 in 1940 who had completed seven years or less of grade school. The second figure represents 100 women of a total of 1,193,660 native white women in the same age group who had completed 8th

grade or 1-3 years of high school. The third figure represents 100 of 713,800 native white women of the same age group who had completed 4 years of high school, 1-3 years of college, or 4 years or more of college.

While the pictograph shows only women, the same increases and decreases are also applicable for male descendants, if the present rates continue. But if the husband were included with the wife the actual number of descendants would have to be doubled, as these are percentage changes.

The replacement rate for white population in 1920 is used as a basis for the increase and decrease during the *first* generation, because women 45-49 in 1940 had most of their children between 1915 and 1925, and these children were exposed to the mortality around 1920.

Allowance also has been made for higher death rates among the lower education groups, although there are no complete records for death rates among education groups.

The replacement rate for white population in 1920 was 2.45 children per woman. The Bureau of the Census has furnished us with this replacement rate. The 1940 replacement rate of 2.22 children per woman used in our December *Bulletin* for women aged 45-49 in 1940 gave all the education groups somewhat higher replacements than was the true situation.

In making allowances for higher mortality among the lower education groups, we have estimated that the lowest education third needed 2.50 children per woman aged 45-49 in 1940 for replacement, the middle third 2.40, and the highest third 2.30.

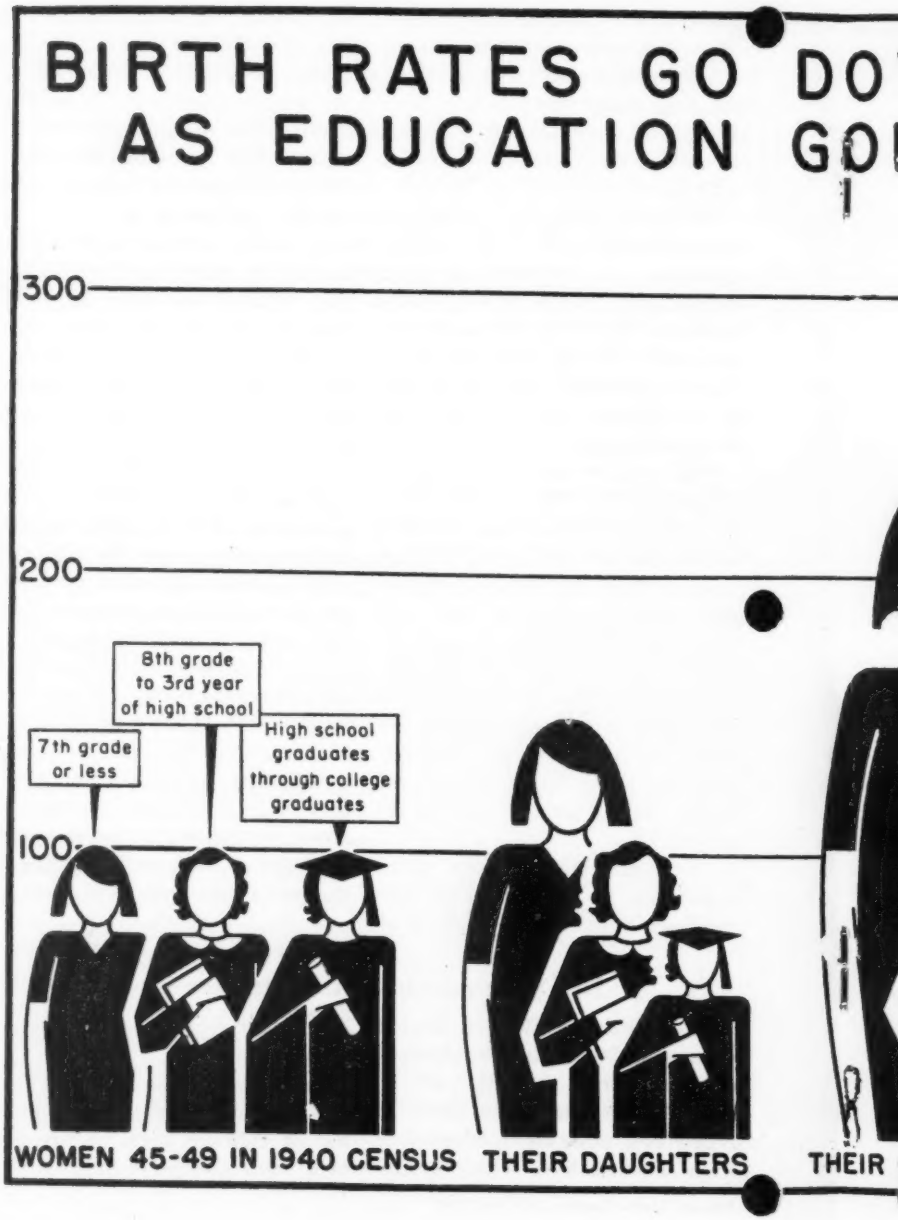
In the second generation we have used the replacement rate for white population in 1940, which was 2.22 children per woman. We have estimated the replacement rates for the three education groups as 2.25, 2.20, and 2.15. Death rates will no doubt be lowered in the future, but so may the birth rates, and the relative sizes of the women in the pictograph are not likely to change significantly, until the present differences in birth rates among education groups tend to be equalized or reversed. We shall now discuss the possibility of reversing the rates.

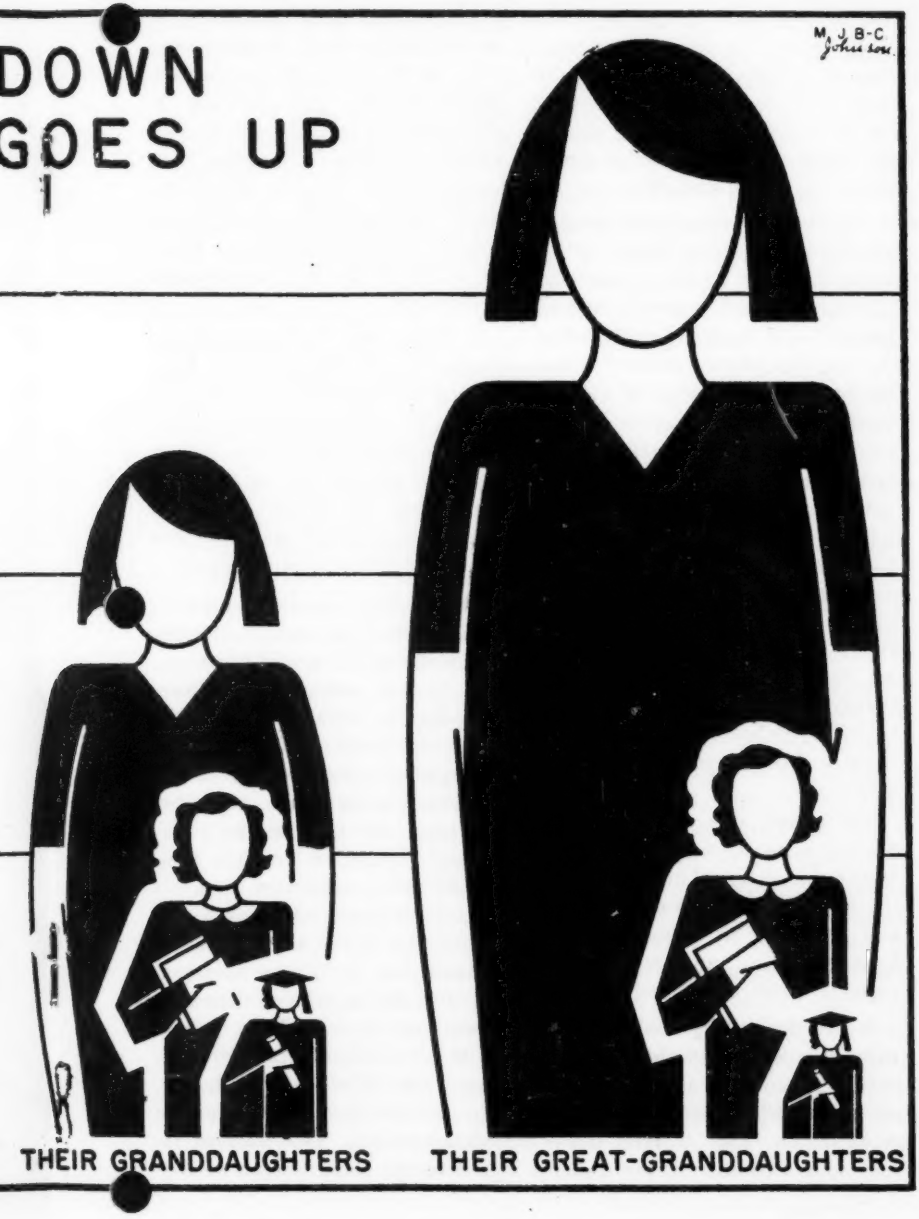
II. Differences in Birth Rates Reversed

In the United States married women aged 30-34 in 1940 who had completed from 0 to 8 years of grade school had given birth to nearly 80% more children per wife than married high school graduates and college graduates in the same age group.

In Stockholm, Sweden, the situation is reversed: the average number of children born to wives of men with college degrees during

* Should read—"between 1910 and 1930"


BIRTH RATES GO DO
AS EDUCATION GO
300
200
100
7th grade or less
8th grade to 3rd year of high school
High school graduates through college graduates
WOMEN 45-49 IN 1940 CENSUS
THEIR DAUGHTERS
THEIR


DOWN
GOES UP
M. J. B-C.
Johnson
THEIR GRANDDAUGHTERS
THEIR GREAT-GRANDDAUGHTERS

the first ten years of marriage was 48% higher than the average number of children born to wives of men who had completed 0 to 8 years of schooling. These figures are based upon the Swedish census reports for 1920 and 1930.

The American and Swedish cases are not strictly comparable for obvious reasons. In the former we are dealing with married women in various education groups, while in the Stockholm study we are dealing with the wives of men in various education groups. It was for this reason that in the American example above we included women who had graduated from high school or had completed one to three years of college. But when due allowance is made for this and other factors, these figures show clearly that in the United States we have a *negative* relationship between education and size of family, while in Stockholm there is an equally distinct *positive* relationship.

To quote the American and Swedish scientists who analyzed the Stockholm data: "The fertility in the group of Stockholm families was found to be lowest with the least education and to increase regularly with further education."

Before proceeding further, something should be said about the scientists who made the Stockholm study and why they happened to make it. Dr. Karl A. Edin is Docent and Director of the Demographic Institute in the University of Stockholm and Departmental Chief of the Swedish Central Statistical Board. Dr. Edward P. Hutchinson is equally well known among American demographers, having been a member of the National Resources Planning Board and for a number of years a director of the Population Association of America.

In 1927 at the World Population Conference in Geneva, Dr. Edin startled the representatives of many nations by presenting a study showing that in Stockholm the higher economic groups had the highest birth rates, and as the income increased from group to group the size of the family also increased.

This finding was so contrary to the findings of practically all other studies of the differential birth rate that it was difficult to believe. However, in 1930, Dr. Friedrich Burgdorfer made a similar discovery regarding the reversal of the differential birth rate in large German cities. In 1932, at the International Population Union in London, Dr. Edin elaborated upon his original findings, whereupon the Institute for Social Sciences at the University of Stockholm arranged with the Social Science Research Council of New York to release Dr. Hutchinson, of Harvard University, to collaborate with Dr. Edin in further analyzing the Stockholm data. This analysis resulted in the book, *Studies of Dif-*

ferential Fertility in Sweden, published by P. S. King & Son, London.

This book not only verified and elaborated upon Dr. Edin's original findings, which were based upon the 1920 Swedish census, but also carried the studies up to the 1930 census and found that all along the line among economic, occupation, education, and social groups in Stockholm the higher the status the higher the birth rate, and the lower the status the lower the birth rate.

Every conceivable check and cross reference was made on the vital statistics of Stockholm, yet this did not disturb the results: the upper strata in income, occupation, and education had the highest birth rates, and the birth rate consistently decreased as the status decreased. Legitimate and illegitimate births were studied. Census reports were checked against employers' records. Whether the wife was employed or not did not disturb the results. The records of one census were checked against the records of another census. Time periods were cut from ten to three years. Education and occupation groups were subdivided according to income, and each group in the subdivision showed the same trend. Different ages at marriage for both husband and wife were used. Duration of marriage was considered. Birth rates were measured by family and by number of years married, but the same trends were observed.

There are more significant conclusions and statistical tables in this book than can be quoted or even explained in a bulletin of this nature. Here we are chiefly interested in the differences in birth rates among education groups, and therefore it is in order to give the final conclusion of Drs. Edin and Hutchinson on this subject.

"THE OBSERVED FERTILITY RATES INCREASED WITHOUT EXCEPTION FROM THE LOWEST TO THE HIGHEST EDUCATION GROUPS. The validity of the observation was confirmed by demonstrating:—

"1. That the fertility differentials were not produced by a more favorable age distribution or a less frequent employment of wives in the more educated groups;

"2. that they were not merely a result of better economic position of the more educated;

"3. that they were not a product of temporary changes in fertility during the post-war years;

"4. that in all probability they were not a result of social class differences in the number of children born to the wives before the observed marriages (illegitimate children plus children of former marriages)." [Capital letters ours.]

The authors further point out that evidence also was obtained to verify the earlier studies based upon 1920 census data which showed higher birth rates among economic

and social groups, and in addition between 1920 and 1930 higher birth rates were found among families which had increased their incomes than among families that had not increased their incomes. It was emphasized that "the previously observed relation of fertility to economic status [made by Dr. Edin in 1927] was found to have been no temporary phenomenon."

Dr. Edin's Original Findings

Dr. Edin began his 1927 report by saying that the careful study of birth rates in different social strata should be considered one of the most urgent and complex inquiries in the statistical study of population. He then went on to say: "It would be interesting to have a study, for the years after the war [World War I], of fertility in different social strata, in a large town, known as practicing birth control."

Dr. Edin said he had made such a study of Stockholm and that the principal result of his examination, for groups standardized according to age, was:

"That the fertility of the upper classes has increased with the income declared in the census: couples having an income of at least 10,000 Swedish crowns in 1920 had a birth rate fifty per cent above the rate for couples with an income of less than 4,000 crowns, and yet even this last-mentioned group had a birth rate perceptibly higher than that of the working class, especially among young couples." (*Proceedings of the World Population Conference,* Edward Arnold & Co., London, 1927, p. 206.)

In 1930 Dr. Friedrich Burgdorfer, Germany's best-known population authority, made similar discoveries concerning the birth rates of large German cities where means of controlling the birth rate had reached all social strata.

"On the basis of statistics taken from the income tax," said Dr. Burgdorfer, "I have recently been able to prove that today the number of children of families with large incomes is not diminishing but increasing. While on the average, in large German cities, up to every 100 married taxpayers in the income group 'under 1,500 reichsmarks' there belong only 96 children, the number increased from income group to income group, until the largest value was reached at the highest income group (over 50,000 reichsmarks) with 140 children to every 100 married taxpayers." (*Bulletin,* International Population Union, September, 1930, p. 12.)

Dr. Warren S. Thompson, Director of the Scripps Foundation for the Scientific Study of Population Problems, and the leading authority in his field for both the Hoover and Roosevelt administrations, commented upon the Edin and Burgdorfer findings as follows: "It is not difficult to understand how this might be the case in populations where practically everyone

knows about and practices birth control as he sees fit. * * * The author has found evidence of a similar tendency in the low ratios of children to women among the Negroes in our Northern cities." (*Population Problems*, McGraw-Hill Book Company, New York, 1935, pp. 386-7.)

In his study of the size of families among Harvard and Yale graduates, Dr. Ellsworth Huntington, eminent geographer and eugenist at Yale University, reaches this conclusion: "In a word, then, where birth control has free rein not only do the most successful people have the most children, but the size of the families is coming back to such a level that these successful people are having more than enough children to replace themselves. * * * So, in the long run, birth control seems to promise the largest families in the best homes at all levels of society." (Hearings, H.R. 5978, 1934, pp. 96-97.)

If we can accept the findings of Drs. Edin, Burgdorfer, Hutchinson, Thompson, and Huntington, it appears that the chief cause of the differences in birth rates among education and economic groups is the difference in knowledge as to the means of controlling the birth rate, and that the equalization of such knowledge might bring about the reversal of the differential birth rate in the United States. In any case, Sweden's national population program (which has won the favor of practically all American demographers) is based largely upon these findings.

College Project

The emergency of the war and the requirements of the peace demonstrate the importance to the nation of intelligent men and women capable of absorbing higher education. For this reason, the low birth rate of college graduates is disturbing.

A recent study of the fertility rate of men graduates from one college found that the children of the classes of 1916 through 1920 failed to replace their parents by nearly 20 per cent. The 1940 census figures showed that the completed families of women with one to four years of schooling averaged 4⅓ children, while completed families of women college graduates averaged 1¼ children.

To measure the extent of this erosion among the graduates of the country's colleges, the Population Reference Bureau is conducting a survey of the classes of 1921 and 1936, the 25th and the 10th reunion classes. The Bureau urges the Secretaries of these classes and the Alumni Offices to forward the necessary data by April 1 for a national comparison available before reunion time.

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